

**Claims**

1. A method for determining haplotype in a template DNA sequence comprising a first and a second polymorphic marker, said method comprising:

- 5           i) combining in a single reaction tube said template DNA sequence, forward primers that are allele-specific for a first polymorphic marker, reverse primers that are allele-specific for a second polymorphic marker, and a Stoffel fragment DNA polymerase;
- 10           ii) conducting polymerase chain reaction (PCR) amplifications in said tube to produce an amplification product; and
- iii) analyzing the amplification product to identify which pair of said forward and reverse primers generated said amplification product;
- wherein the haplotype is determined by the identification of said forward and reverse primer pair.

15           2. The method of claim 1, wherein said template DNA comprises an additional polymorphic marker between said first and second markers, and the haplotype of said additional polymorphic marker is determined by restriction fragment length polymorphism (RFLP) analysis or fluorescent depolarization

20           analysis of the amplification product.

            3. The method of claim 1, wherein said forward or reverse primers are fluorescently labelled and the remaining primers have divergent 5' extensions, and wherein said amplification product analysis comprises gel electrophoresis and

25           fragment analysis.